

What is claimed is:

1. A method of producing a semiconductor device having metal wiring, comprising steps of:

5 forming metal wiring containing an additive on a first insulation film formed in a semiconductor substrate;

forming on said metal wiring a barrier layer for preventing diffusion of constituting elements of said metal wiring; and

10 forming a second insulation film on said barrier layer;

wherein said additive is an element to reduce corrosion of said metal wiring at the time of forming said barrier layer.

2. A method of producing a semiconductor device as set forth in claim 1, wherein an electroless plating step is performed in the step of forming said barrier layer.

3. A method of producing a semiconductor device as set forth in claim 2, wherein said electroless plating step includes a catalyst plating step and a washing step.

4. A method of producing a semiconductor device  
as set forth in claim 3, wherein said additive includes  
an element having less ionization tendency than a  
catalyst substance to be plated in said catalyst plating  
5 process.

5. A method of producing a semiconductor device  
as set forth in claim 1, wherein:  
the step of forming said metal wiring  
10 includes a step of forming a seed layer of the metal  
wiring and a step of forming the metal wiring integrally  
with the seed layer; and  
said additive is mixed in said seed layer for  
the formation.

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6. A method of producing a semiconductor device  
as set forth in claim 1, wherein:  
the step of forming said metal wiring  
includes a step of forming a seed layer of the metal  
20 wiring and a step of forming the metal wiring integrally  
with the seed layer; and  
said additive is stacked in said seed layer  
for the formation.

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7. A method of producing a semiconductor device

as set forth in claim 1, wherein a step of performing heat treatment so that said additive segregates on a grain boundary of said metal wiring is further included after the step of forming said metal wiring.

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8. A method of producing a semiconductor device as set forth in claim 1, wherein:

the step of forming said metal wiring includes a step of forming a seed layer of the metal wiring and a step of forming the metal wiring integrally with the seed layer; and

said additive is mixed in said metal wiring in the step of forming the metal wiring integrally with the seed layer.

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9. A method of producing a semiconductor device as set forth in claim 1, wherein:

a step of forming a wiring groove in said first insulation film is included before the step of forming said metal wiring; and

said wiring groove is buried with a wiring material for formation in the step of forming said metal wiring.

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10. A method of producing a semiconductor device as set forth in claim 1, wherein:

a step of forming a wiring groove and a contact hole connected to said wiring groove in said first insulation film is included before the step of forming said metal wiring; and

said wiring groove and said contact hole are buried with a wiring material for formation in the step of forming said metal wiring.

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11. A method of producing a semiconductor device as set forth in claim 1, wherein metal wiring containing copper (Cu) is formed in the step of forming said metal wiring.

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12. A method of producing a semiconductor device as set forth in claim 1, wherein a barrier layer containing cobalt (Co) is formed in the step of forming said barrier layer.

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13. A method of producing a semiconductor device as set forth in claim 12, wherein a barrier layer containing cobalt (Co) - tungsten (W) - phosphorus (P) is formed in the step of forming said barrier layer.

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14. A method of producing a semiconductor device  
as set forth in claim 4, wherein:

the catalyst substance to be plated in said  
catalyst plating step is palladium (Pd); and

5 the element having the less ionization  
tendency than the catalyst substance to be plated in said  
catalyst plating step contains any one of iridium (Ir),  
platinum (Pt) and gold (Au).